Amendments to The Claims

This listing of claims will replace all prior versions and listings of claims in the pending application.

A. Listing of Claims

1. (Currently amended) A computer-readable medium having computer-executable instructions for performing a method of using expressions to establish a relationship between properties in code executable by a browser running on a computer, each property defining a characteristic of an object, wherein the computer-readable instructions are written in HTML code and define a document that forms the browser, the method comprising:

> declaring the value of a first property as a scalar value, wherein the first property is a width of a window of the browser;

> declaring the value of a second property as an expression, wherein the second property is a function of the first property, and wherein the expression represents an element in the window of the browser; [[and]]

> automatically changing the value of the second property in response to a change in the value of the first property; and

> updating the document upon changing the value of the second property.

2.-4. (Cancelled)

5. (Currently Amended) A computer-readable medium having stored thereon a data structure, the data structure including a plurality of nodes, comprising:

> at least one leaf node stored in memory, each leaf node containing a scalar property, wherein the scalar property is a width of a window of a browser;

> at least one expression node stored in memory, the at least one expression node containing an expression written in a markup language and defining a dynamic property, the expression being a function of the scalar property, the expression for programming formatting instructions, wherein the expression represents an element in the window of the browser;

> at least one pointer stored in memory, the at least one pointer mapping a

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dependent/dependency relationship between the scalar properties and the expressions, wherein upon notification of a change in the value for one of the scalar properties, [[a]] the browser executes the expressions dependent on the scalar property having a changed value.

6. (Currently Amended) The computer-readable medium of claim 5 wherein the data structure is formed by [[a]] the browser.

7. (Original) The computer-readable medium of claim 6 wherein the markup language is HTML.

8. (Original) The computer-readable medium of claim 6 wherein two or more pointers map two or more scalar properties, respectively, to a single expression.

9. (Original) The computer-readable medium of claim 6 wherein two or more pointers map a single scalar properties to two or more expressions, respectively.

10. (Original) The computer-readable medium of claim 6 wherein two or more pointers map a single expression to two or more different expressions, respectively.

11. (Original) The computer-readable medium of claim 6 wherein at least one of the pointers maps a dependent/dependency relationship between two expressions.

12. (Original) The computer-readable medium of claim 6 wherein:
   one of the pointers maps a dependent/dependency relationship between a scalar property and a first expression and another pointer maps a dependent/dependency relationship between the first expression and a second expression, the first expression forming a least-dependent expression and the second expression forming a most-dependent expression; and
the browser executes the expressions in the order of the least-dependent expression to the most-dependent expression.

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13. (Previously presented) The computer-readable medium of claim 12 wherein:

    two pointers map the second expression to the first expression and a third expression, respectively, the second expression being dependent on the first and third expressions thereby being more dependent than the first and third expressions; and

    the browser does not execute the second expression until the first and third expressions are executed.

14. (Currently Amended) A method of using expressions to establish a relationship between properties of a document generated by HTML code that is executable by a browser, the properties including constant properties and dynamic properties, the method comprising:

    declaring a value of one or more scalar properties, wherein the value of the scalar properties is not a function of another property, and wherein at least one of the scalar properties is a width of a window of the browser;

    creating one or more expressions declaring a value of a dynamic property, the dynamic property being a function of another property, the expression for programming formatting instructions, and wherein the expression represents an element in the window of the browser; and

    generating a dependency graph, the dependency graph having a plurality of nodes, including at least one expression node and one leaf node, the at least one expression node corresponding to an expression and the at least one leaf node corresponding to a value of a scalar property, the dependency graph mapping the relationship between the properties.

15. (Original) The method of claim 14 wherein the nodes have a dependent/dependency relationship to one another and each node has either a dirty state or a clean state, the method further comprising:

    when the value for one of the properties changes, changing the state of the node corresponding to the changed property to dirty;

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propagating the dirty state to each of the nodes in the dependency graph that are

dependent on the node corresponding to the changed property; and

recalculating the values of the expressions stored the nodes having a dirty state.

16. (Original) The method of claim 15 wherein recalculating the values of the expressions is performed automatically after completion of propagating the dirty state to each of the nodes in the dependency graph.

17. (Previously presented) The method of claim 16 wherein:

the dependency graph includes a plurality of expression nodes mapped in network

wherein the most-dependent expression node in the network has no dependent

expression nodes and the least-dependent expression node depends directly on a

scalar property; and

recalculating the values of expressions stored in nodes having a dirty state includes (a)

executing the expression corresponding to each of the expression nodes in the

network beginning with the least-dependent node and ending with the most-

dependent node, and (b) assigning the value of each executed expression to the

dynamic property corresponding to that executed expression.

18. (Original) The method of claim 17 wherein the HTML code generates a user interface upon execution and at the property declared by the expression corresponding to the child node defines as least a portion of the user interface, the method further comprising updating the user interface upon assigning the value to the property declared by the expression corresponding to the child node.

19. (Currently Amended) A computer for determining and outputting dynamic properties in HTML code received from a computer network, the computer comprising:

a processor:

a peripheral in data communication with the processor;

memory in data communication with the processor, the memory storing a browser for

execution by the processor, the browser including code programmed to:

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   (a)   analyze the HTML code to identify scalar properties and expressions, at least one of the expressions defining the value of a dynamic property and being a function of at least one scalar property, wherein the scalar property is a width of a window of the browser, and wherein the expression represents an element in the window of the browser;

   (b)   map a dependent/dependency relationship between the at least one of the expressions and the scalar properties, wherein each expression depends from at least one scalar property; and

   (b)   upon notification of a change in value of the scalar property, execute the at least one of the expressions that depends on the scalar property having a changed value.

20. (Original) The computer of claim 19 wherein:

the scalar properties and the expressions are mapped into a dependency graph and the browser is further programmed to assign a dirty state to each scalar property upon notification of a change in the scalar property's value, and propagate the dirty state from the scalar property to each expression that is dependent on the dirty scalar property; and

the browser code programmed to execute each expression is further programmed to execute only those expressions having a dirty state.

21. (Previously presented) The computer of claim 20 wherein the browser code programmed to execute each expression is further programmed to execute each expression in the dependency graph in sequential order from a least-dependent expression to a most-dependent expression, the least-dependent expression depending directly on a scalar property and the most-dependent expression having no dependent expressions.

22. (Original) The computer of claim 20 wherein the computer further includes an input for receiving a signal, and the browser further includes code programmed to notice when a signal received by the input changes the value of a scalar property, and in response thereto

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automatically execute each expression that depends on the scalar property having a value changed by the input signal.

23. (Original) The computer of claim 19 wherein the peripheral is a computer monitor and the browser is further includes code programmed to display an HTML document having dynamic properties on the computer monitor.

24.-28. (Cancelled)

29. (Currently Amended) A computer data signal embodied in a carrier wave readable by a computing system and encoding a computer program of instructions for executing a computer process using expressions to establish a relationship between properties of a document generated by HTML code that is executable by a browser, the properties including constant properties and dynamic properties, said computer process comprising:

> providing a value of one or more scalar properties, wherein the value of the scalar
>> properties is not a function of another property, and wherein at least one of the scalar properties is a width of a window of the browser;
> creating one or more expressions declaring a value of a dynamic property, each dynamic
>> property being a function of another property, the expression for programming formatting instructions, and wherein the expression represents an element in the window of the browser; and
> generating a dependency graph, the dependency graph having a plurality of nodes,
>> including at least one expression node and one leaf node, each expression node corresponding to an expression and each leaf node corresponding to a value of a scalar property, the dependency graph mapping the relationship between the properties.

30. (Original) The propagated signal of claim 29 wherein the nodes have a dependent/dependency relationship to one another and each node has either a dirty state or a clean state, and the computer process further comprises:

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when the value for one of the properties changes, changing the state of the node

corresponding to the changed property to dirty;

propagating the dirty state to each of the nodes in the dependency graph that are

dependent on the node corresponding to the changed property; and

recalculating the values of the expressions stored in nodes having a dirty state.

31. (Original) The propagated signal of claim 30 wherein the act of recalculating the values of the expressions is performed automatically after completion of the act of propagating the dirty state to each of the nodes in the dependency graph.

32. (Original) The propagated signal of claim 30 wherein the dependency graph includes a plurality of expression nodes mapped in network wherein the most-dependent expression node in the network has no dependent expression nodes and the least-dependent expression node depends directly on a scalar property; and the act of recalculating comprises:

executing the expression corresponding to each of the expression nodes in the network

beginning with the least-dependent node and ending with the most-dependent

node; and

assigning the value of each executed expression to the dynamic property corresponding to

that executed expression.

33. (Original) The propagated signal of claim 32 wherein the HTML code generates a user interface upon execution and at the dynamic property declared by the expression defines at least a portion of the user interface, and the computer process further comprises: updating the user interface upon assigning the value to the dynamic property.

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